Spatial patterns of snow stability
throughout a small mountain range

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ABSTRACT. This research investigates snow stability on the eastern side of a small mountain range in southwest Montana, U.S.A., on one mid-season day and one late-season day during the 1996-97 winter. Although previous research has addressed snow stability at smaller spatial scales, this is the first field-based study to investigate snow stability (as measured by stability tests) over a mountain range in order to better understand its spatial distribution and the implications for predicting dry slab avalanches. Using helicopter access, six two-person sampling teams collected data from over 70 sites on each of the two sampling days. Variables for terrain, snowpack, snow strength, and snow stability were generated from the field data, and analyzed using descriptive statistics, correlation analysis, and multiple regression. Results from the first sampling day show stability is only weakly linked to terrain, snowpack and snow strength variables due to consistently stormy weather conditions leading up to that day. The second field day's results demonstrate a stronger relationship between stability and the other variables due to more variable weather conditions that ranged from periods of sunshine to storms. On both days stability decreased on high elevation, northerly facing slopes. The data structure complexity provides insights into the difficulties faced by both scientists and conventional avalanche forecasters in predicting snow avalanches.